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AEROSOL PARTICLE ANALYZER FOR MEASURING THE AMOUNT OF ANALYTE IN AIRBORNE PARTICLES

Abstract

Aerosol particle analyzer (APA) for measuring the amount of analyte in airborne particle is described. The APA uses an analysis liquid. When this analysis liquid is mixed with the particles, an optical property of the analysis liquid (CDAL) varies according to the amount of the analyte in the particles. A charged droplet of the analysis liquid is levitated. Airborne particles are drawn into the instrument and given a charge that is opposite that of the CDAL, and made to flow near the CDAL so that electrostatic forces greatly increase the probability that the CDAL and charged particles will combine. Then the CDAL is ejected into a horizontally oriented linear quadrupole that is in an airtight container, except for a small orifice to let the CDAL enter. The CDAL is levitated in a high humidity environment so that it evaporates slowly, so that there is time for the reaction between the analyte, if any, and the CDAL can take place, and so that the optical property, typically fluorescence, can be measured. The amount of the analyte in the

particle is determined from the measured fluorescence or other optical property.